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September 15, 1951

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Protein Atoms

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GENERAL SCIENCE

Many Top Chemists Barred

McCarran Act restrictions kept about a dozen of world's leading chemists from the World Chemical Conclave in New York. Visa applications pile up.

➤ BECAUSE THEY had not been able to get U. S. visas under the restrictions of the McCarran Act, about a dozen of the world's leading chemists were excluded from the World Chemical Conclave held in New York.

From Italy, France and Switzerland have come cables telling of inability of even official delegates to the International Union of Pure and Applied Chemistry to get into the country, despite the almost frantic efforts of officials of the National Research Council, American Chemical Society and the U. S. Department of State to cut through the mandatory restrictions set up recently by Congress.

Among those who were not present, although their papers were scheduled for the International Chemical Congress program were:

Mlle. Marguerite Perey, French discoverer of the chemical element 87, Francium.

Dr. L. Ruzicka, Nobelist in chemistry and leading Swiss chemist from Zurich.

Prof. Giulio Natta, of Milan's Institute of Industrial Chemistry, member of the official Italian delegation.

Prof. Mario A. Rollier of Milan's Polytechnic Institute.

Dr. Francesco Giordani, in charge of the Italian delegation.

The newly amended immigration law makes it mandatory that everyone wishing to enter the United States on a visit shall answer dozens of questions, listing all the organizations to which they have ever belonged. If any of them can be interpreted as Fascist or Communistic in the slightest degree, the visa request must be forwarded by the American Consul to the State Department in Washington.

Consequently visa requests by the thousands have piled up in Washington, requiring weeks to get action, since Congress did not provide funds to handle this extra load at the same time that it imposed the new restrictions.

Because many of the foreign chemists in their fifties have been members of societies now under political suspicion, their visa requests have piled up in Washington. Some have been fished out of the mounting pile and given the approval of the Attorney General that allows them to come into the country. But some have been caught in the jam.

Some eminent, specially invited guests, like Dr. Ruzicka, have given up in disgust. He is reported to have had his visa questioned because he has not resigned a foreign membership of an Iron Curtain science academy, an honor received before World War II. Dr. Ruzicka, rated as a conservative politically, has been in this country repeatedly and attended the 1933 Chicago International Chemical meeting.

The cloud upon Mlle. Perey is reported to be that she invited Mme. Irene Joliot-Curie to the dedication of her research laboratory about a decade ago.

Dr. Ruzicka and Mlle. Perey were finally given visas but too late for them to attend the meeting. Dr. Ruzicka announced that private reasons prevented his going to the United States and that he had not been requested to renounce any academic membership.

One Sydney chemist, born in Hungary and an Australian citizen for eight years, got the visa for himself and wife only after overseas telephone calls of explanation.

While many of the older chemists from overseas experienced delays and inconveniences over their visas, $525,000 was being spent by ECA and the Ford Foundation to bring 310 foreign chemists under 40 to attend the meeting and tour America. This goodwill expenditure is felt here to be neutralized to a considerable extent by the visa difficulties the older and more eminent chemists have experienced.

One admitted communist chemist, Dr. Steig Veibel, an official delegate to the International Union of Pure and Applied Chemistry from Denmark, was refused a visa even though he desired to sign a pledge not to engage in any political activity in this country. Dr. Veibel commented bitterly that if America kept such strict exclusion laws no more international meetings could be held in America and the United States would be in the same class with Russia in this respect.

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PSYCHOLOGY

TV Schools Better But Teachers Cheaper

➤ YOU CAN go to school by television. In fact you can actually learn more from the instructor on the TV screen than you would if you were face to face with the teacher.

This is the experience of the Navy in teaching Navy Reservists it was reported to the meeting of the American Psychological Association in Chicago by Prof. Robert T. Rock, Jr., of Fordham University, New York, who directed a program of evaluation conducted by Fordham and the Special Devices Section of the Navy.

But college professors need not fear that their jobs will be taken over by television studios, Prof. Rock predicted. Television is expensive—too expensive for the ordinary educational institution, or even for the Armed Services under ordinary conditions. Its main usefulness is for teaching large groups of men when they must be trained in a great hurry and they cannot all be crowded into a single classroom.

Advantage of the television program over the ordinary training film is that the television lesson may be kept up to the minute. The training film takes many months to prepare and in subjects that are changing may be obsolete before it is ready for use. It takes only two days to get the television program ready for the camera and it can be revised up to the last minute.

Television also has the advantage of newness: people like to learn by this medium.

Hollywood techniques of dramatized instruction do not work so well as does the straight lecture method with the screen picking up a view of the machine, part, or object being described, not the face or mouth of the lecturer, Prof. Rock said. Techniques need to be developed and television instructors need to be specially trained to make TV as effective as it could be for education.

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MEDICINE

Cold Spray to Chest Helps Heart Victims

➤ FASTER TREATMENT for a sick heart can be given if the patient's chest is first given a cold spray of ethyl chloride to stop the excruciating pain of some heart attacks.

In coronary thrombosis, caused by blood clots that block off vital circulation to the heart, severe pain can paralyze the recuperative powers of the heart in the crucial moments after an attack has begun. As a result, physicians in many cases must treat for pain and shock before launching important life-saving measures. The spray, it is believed, would avoid this, and enable physicians to direct immediate attention to the coronary condition.

The cold spray method was developed by Dr. Janet Travell of Cornell University Medical College, Ithaca, N. Y. For further study of this cold spray method of stopping pain, Dr. Travell has received a $6,000 grant from the U. S. National Heart Institute.

Largest single grant, $81,000, of the $3,038,418 announced this week, goes to Dr. John W. Gofman of the University of California at Berkeley for further study of biochemical and biophysical factors in the development of hardening of the arteries. Dr. Gofman is the originator of the controversial low-cholesterol diet which he believes will ward off or slow down artery hardening.

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CHEMISTRY

Atomic Hair-Splitting

Chemists report researches on shape of protein molecules, that of hair being a long, coiled spring. Helical shape controversy now raging across Atlantic.

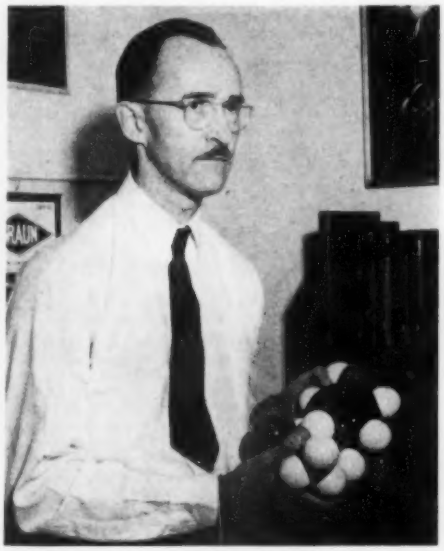
See Front Cover

➤ LITERAL HAIR-SPLITTING on the atomic scale is telling the secret of stuff that makes up hair. A controversy on the shape of protein molecules of hair is now being tossed back and forth across the Atlantic.

Dr. Linus Pauling and Dr. Robert B. Corey at the California Institute of Technology, told the American Chemical Society meeting in New York that the helix, the long coiled spring, best illustrates the molecular structure of keratin and certain other proteins.

Keratin is the substance of hair, wool, finger-nails and other skin modifications. Fibers of contracted muscles, and some simpler proteins made in the laboratory have their smallest, finest structures in the same form, Drs. Pauling and Corey have found.

The conquest of disease and even the fundamental puzzle of life itself is wrapped up in the structure of proteins and other polypeptides. That is why discovering their form is important.



SPIRALLING ATOMS — Research by Dr. Robert B. Corey, pictured here, and Dr. Linus Pauling and associates at the California Institute of Technology on the previously obscure structure of proteins has shown that the atoms which make up bone, wool, muscle, red blood cells and other proteins are arranged in the form of a spiralling spring.

In the structure announced by Drs. Pauling and Corey, some 37 repeats of the simplest chemical unit of the protein occupy ten turns of the spring.

Objection to Dr. Pauling's conclusion appears in the British journal, NATURE (Aug. 25), which recently reached the U. S. It is based on a different interpretation of X-ray photographs of some of these proteins by Drs. C. H. Bamford and W. E. Hanby, of Courtaulds Research Laboratory, two of the men who took the photographs that Dr. Pauling and his associates used. The British team find certain measurements of molecular distances smaller in their interpretations than those reported by the California scientists, and thus cast doubt on the helix structure.

Dr. Pauling, using sticks and wooden balls, made molecular models sized in proportion to measurements made with X-ray beams on crystals of the protein material. By experimenting with these models he developed his theory. His conclusions have been verified by Dr. M. F. Perutz of the Cavendish Laboratory, Cambridge University, England.

Shown on the cover of this week's SCIENCE NEWS LETTER is an x-ray photo of a crystal of asparagine monohydrate, one of the amino acids which make up proteins. The spots are reflections from the planes of atoms in the crystal. From the positions and intensities of the spots, the positions of the atoms are determined.

Another structure announced by Dr. Pauling and his California associates is the "pleated sheet" form of feather protein. Atoms in this substance form zig-zag connections between the spreadout layers of feather keratin.

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PSYCHOLOGY

Paralyzed Patients Move Legs After Hypnosis

➤ PATIENTS WITH spinal cord injury with legs completely paralyzed and numb for as much as two years were enabled to move their legs again as a result of hypnosis.

Four such dramatic cases were reported to the meeting of the American Psychological Association in Chicago by Dr. Dorothy Twichell Chappell of the University of Michigan and Kennedy Veterans Administration Hospital.

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PROTEIN RESEARCH — Dr. Linus Pauling of the California Institute of Technology shown with a model of a polypeptide chain of amino acids such as found in proteins of connective tissue and bones. Research by Drs. Pauling, Robert B. Corey and associates on the structure of protein atoms was reported at the American Chemical Society Diamond Jubilee Meeting in New York.

SOCIOLOGY

Social Beliefs Depend On Way Person Thinks

➤ THE WAY a person thinks about social problems depends on whether he is radical or conservative, tenderminded or toughminded.

People who are tenderminded and conservative believe in survival after death, compusory religious education and in the need for a general return to religion. Those who are tenderminded but radical believe in pacifism, more lenient treatment for prisoners and the need for a whole state.

Conservative toughminded people are war-minded, anti-semitic and prejudiced against Negroes. Radical toughminded people favor trial marriage, easier divorce laws and think Sunday observance is old-fashioned.

Toughminded people, regardless of their radical or conservative leanings, are all for compulsory sterilazation and euthanasia; while all tenderminded people seem to favor the principle that the state exists for the benefit of the individual.

These facts were presented recently to the British Association for the Advancement of Science by Dr. H. J. Eysenck of London's Institute of Psychiatry at Maudsley Hospital. He gave a battery of psychological tests (including inventory of social attitudes, national preferences test, and a Social Test) to 500 adults, who were urban, middle-class men and women.

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MEDICINE

Simple Polio Test

➤ A SIMPLE test for diagnosing polio, one of the most pressing needs in the fight against the disease, is now in the development stage.

Such a test for one strain of the virus has actually been worked out by Drs. Jordi Casals and Peter K. Olitsky of the Rockefeller Institute, New York, with the assistance of Major Ralph O. Anslow of the U. S. Army.

But the test is not yet ready for general use, Dr. Casals stated in reporting it to the Second International Poliomyelitis Conference in Copenhagen, Denmark.

It is of the type known as complement-fixation, which is the same general type of test used in the Wassermann test for syphilis.

Discussing the need for such a test, Dr. Joseph E. Smadel of the U. S. Army Medical Service Graduate School said that present tests for polio, which require the use of monkeys or at least mice, are "cumbersome, expensive and highly technical procedures."

The need for a simple diagnostic test was further pointed up by Dr. Robert Debré of Paris, who said that diseases ranging from arthritis to pneumonia can be mistaken for polio when the diagnosis is made on the basis of the symptoms.

Good news for polio fighters appeared in the report that probably only three strains of polio virus exist. Scientists at one time feared there might be many more, which would greatly complicate both diagnosis and any chance of developing a vaccine against the disease.

The report that there are apparently only three was given by Dr. Jonas Salk of the University of Pittsburgh School of Medicine who is chairman of a committee of scientists from four universities who have been working on the problem of classifying the strains of polio virus.

Of 100 strains studied so far, 85 are of the Brunhilde type, 12 are Lansing type and three are Leon type.

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NUTRITION

Antibiotic for Chick Growth

➤ WHEN CHICKS grow faster after being fed penicillin, the reason seems to be that lurking micro-organisms affecting them are suppressed.

This has been discovered by a dual experiment in which a batch of chicks was split and raised with identical feed at the National Institute for Research in Dairying at the University of Reading and at Glaxo Laboratories, Ltd., in Greenford, Middlesex, England.

At the Greenford laboratories the chicks without penicillin did just about as well as those with the antibiotic raised at the same place where chickens are not normally raised. The Greenford chicks did about as well as the pencillin-treated chicks at Reading, but the birds without penicillin at Reading were markedly lighter and slower to grow.

The two groups of scientists in a report to the journal, NATURE (Aug. 25), conclude that the growth stimulation is due to a clean-up of some organism that gets established where poultry is raised.

Since dramatic results in America and elsewhere have been widely reported for additions of antibiotics and vitamin B-12 to poultry feeds, the British results may be useful in practical chicken raising.

The scientists suggest that the antibiotics may also stimulate growth by creating in the chicken's food-using mechanism conditions more favorable for the manufacture and use of vitamins, such as animal protein factor (APF), necessary to good growth.

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Question Box

ARCHAEOLOGY

What link has been found between people of Japan and ancient Americans? p. 169.

CHEMISTRY

What chemicals could be the key to cancer control? p. 166.

What chemical "missing link" joining plant and animal life has been reported? p. 174.

MEDICINE

What is the effect of a cold spray on a heart attack victim? p. 162.

How can damage from polio be lessened? p. 172.

NUTRITION

How much fat is contained in a recent reducing diet? p. 166.

What B-family vitamin has been discovered? p. 168.

PLANT PATHOLOGY

How can fungus diseases of plants now be spotted quicker and cheaper? p. 168.

PUBLIC HEALTH

What birds have been found to carry the germs of encephalitis? p. 167.

PSYCHOLOGY

How does hypnosis help paralyzed patients? p. 163.

Photographs: Cover and p. 163, California Institute of Technology; p. 165, Westinghouse Electric Corporation; p. 167, Boeing Airplane Company; p. 170, Civil Aeronautics Administration.

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ENGINEERING

Fluorocarbon Jet Spray

Development of new cooling technique that promises electric transformers as much as one-third lighter than present units aided by electrical "howitzer."

➤ THE RELATIVELY new chemicals known as fluorocarbons when used as a cooling spray greatly increase the efficiency of electrical transformers, Westinghouse scientists revealed in Sharon, Pa.

These chemicals permit the delivery of 3.5 times as much power as is produced by conventional oil-cooled transformers. This comes from the ability of the fluorocarbons to dissipate by vaporization 10 times as much of the heat created in the transformer.

Transformers are the familiar black metal boxes on electrical distribution systems that cut the voltage of the current from feeder lines to safe limits to use in a building. This new cooling system will probably find its first application in the giant transformers which reduce the extremely high voltage used in cross-country power lines to lower voltages for local distribution.

Fluorocarbons are similar to the hydrocarbons of petroleum but differ in that all the hydrogen is replaced by fluorine. They are synthetic compounds, made by a new electro-chemical process, which entails no use of the dangerous free fluorine. There is no natural source of fluorocarbons corresponding to petroleum and coal for hydrocarbons.

The development of fluorocarbon cooling sprays for transfomers is the result of work by scientists of Westinghouse Electric Corporation in Sharon, Pa. As explained by Dr. Paul Narbut, Westinghouse engineer, instead of filling the transformer tank with oil, a small quantity of liquid fluorocarbon is stored at the bottom of the tank.

This liquid is pumped to a nozzle that sprays it directly on the hot transformer core and coils. The heat evaporates some of the liquid. The vapors formed then circulate toward the cooling surfaces of the transformer tank where they condense and release the heat taken from the coils. The condensed liquid flows back to the bottom of the tank for reuse.

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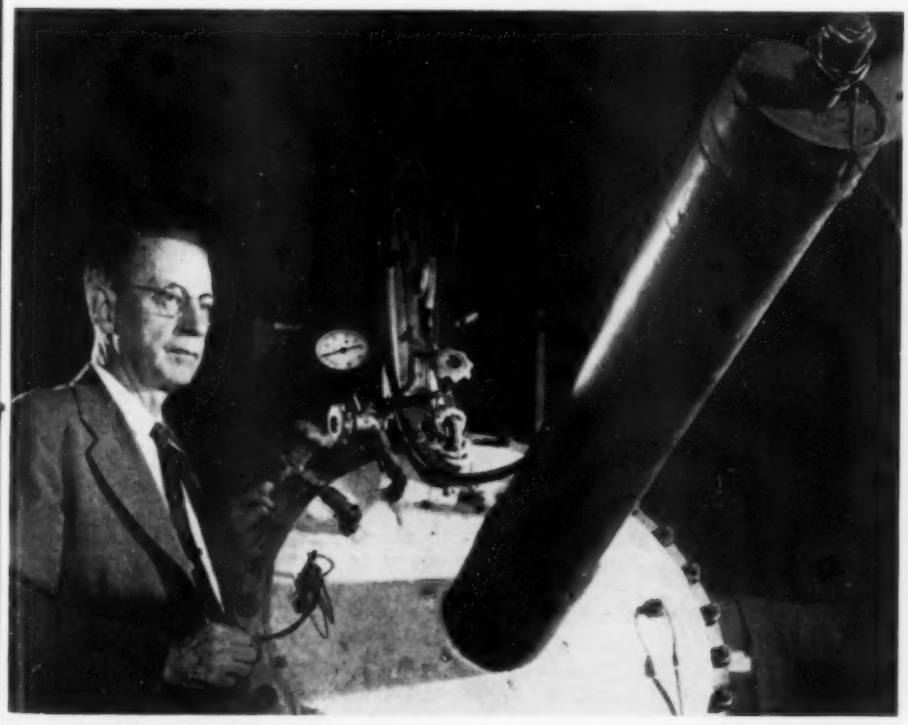

ELECTRICAL "HOWITZER"—Dr. C. F. Hill of Westinghouse Research Laboratories here shows the equipment used to bombard fluorocarbons with electrical strokes ranging up to 300,000 volts to develop cooling spray for transformers.

● RADIO

Saturday, Sept. 22, 1951, 3:15-3:30 p. m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Armand Spitz, director of the Spitz Laboratory, Philadelphia, will discuss "Seeing the Stars."

With this program "Adventures in Science" takes a vacation because of the broadcasting of football games. It is expected to resume December 1.

AERONAUTICS

Space Flights Can Now Be Planned on Global Basis

➤ SPACE FLIGHT planning is now on a global basis as a result of the formation in London of the International Federation of Aeronautics.

The following ten countries are members: Argentina, Austria, Britain, France, Germany, Italy, Spain, Sweden, Switzerland and the United States.

Headquarters of the new organization will be in Switzerland. Its president is Dr. Eugene Saenger, German rocket pioneer now developing rockets and jets for the French Air Ministry. Vice presidents are the German physicist, Dr. G. Loeser, and Andrew G. Haley, Washington, D. C., expert on international and technical law, formerly president of the Aerojet Engineering Corporation and now associated with the American Rocket Society.

The object of the Federation is the coordination, dissemination and direction of theoretical research and information. It aims to keep a step ahead of official research establishments.

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MEDICINE

Future Medical Use for Lung Banks Foreseen

➤ LUNG BANKS may some day join the blood, bone, artery, eye and nerve banks which doctors now draw on to save lives and patch sick bodies.

This possibility is suggested by a report of Drs. George R. Gerst, Jacob Grossman and Adrian Kantrowitz of Montefiore Hospital, New York, to the journal, SCIENCE (Sept. 7).

The donor lungs, presumably to come from persons just after death, would be used temporarily for supplying oxygen to patients undergoing heart surgery. At present in such operations mechanical pumps are used to short-circuit blood from the area of the heart being operated on.

But in future heart operations it may be necessary to divert blood from all the heart chambers, the Montefiore doctors predict. In such a case there would be a problem of getting enough oxygen into the blood for circulation through the body.

They report successful use of a donor lung for such a purpose in rats.

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CHEMISTRY

Key to Cancer Control

"Life-managing" nucleic acids and their derivatives seen as key to cure and prevention of cancer in papers presented at World Chemical Conclave.

➤ THE KEY to the cure and prevention of cancer, goal of extensive medical research today, seems to lie in the complex "life-managing" nucleic acids and their derivatives.

These chemicals hold the power of assuring the orderly multiplication of living cells such as occur in health. When unusual or absent these vital chemicals promote the riotous or disordered growth that is cancer.

This was learned from the first papers presented before the two-week World Chemical Conclave organized to celebrate three-quarters of a century of the American Chemical Society.

Many of the chemical attacks on cancer are based upon attempting to interfere with the nucleic acids of the cell, Dr. George Bosworth Brown of Sloan-Kettering Institute, New York, told the chemists.

One of the principal actions of material fighting cancer is to stop the synthesis of nucleic acid, a team from the Southern Research Institute, Birmingham, Ala., reported. The chemists were Howard E. Skipper, L. L. Bennett, Jr., and Glynn P. Wheeler.

The cancer-producing chemical reactions involve the tiny particles within the cells, called the chromosomes, which determine the growth, constitution and reproduction of the cells that make up the living body. This was emphasized by a British biochemist, Dr. Eric Boyland of London's Royal Cancer Hospital. A nucleic acid deficiency or an unusual nucleic acid can be associated, he has found, with abnormalities when cells divide.

Cancer can be prevented practically by guarding against chemicals that are known to produce cancers, Dr. Boyland urged. In the case of cancer, prevention is truly better than cure, he emphasized. Already many cases of cancer have been discovered and largely eliminated, among them:

Radium that causes cancer of the bones, X-rays, certain oils used for lubrication, soot that used to cause cancer in chimney sweeps, arsenic, beryllium metal, mustard gas and nitrogen mustards, the aromatic compound benzpyrene found in coal tar, the dye butter yellow used at one time to color foodstuffs.

Arsenic present in cigarettes may be in part responsible for some cancer of the lung, Dr. Boyland said, but there is at present no laboratory test that will reveal the carcinogenic activity of arsenic for man. If there were experiments to detect the cancer-producing properties of various materials, unsuspected dangerous agents in everyday use would undoubtedly be revealed.

More than one chemical process within the living cells can lead to cancer, Dr. Boyland explained. The diversity of cancer-producing agents makes this probable. The hope is that by finding out mechanisms by which different chemicals that cause cancer produce their effects, it will be possible to discover and treat the cancer causes within the cells themselves.

The "chemical of life" which plays an essential role in life processes of the cell is involved in cancer. This is desoxyribonucleic acid, necessary for maintenance of normal cell division. Cancer-causing chemical agents do their dangerous work by affecting this basic cell component, sometimes breaking it down and in other cases joining with it to keep it from doing its normal work.

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NUTRITION

Reducing Diet Has Half Fat in 1400 Calories

➤ THE DAY may be coming when fat men and women will be able to eat fatty foods, such as pork, and drink whole milk instead of skim milk and still lose weight.

Students at Cornell University, Ithaca, N. Y., lost an average of 18 pounds in two months on such a diet. Of their 1,400 calories a day, one half came from fat. Whether the diet will be equally successful for older people as for the 10 overweight students who volunteered to follow it at Cornell will not be known without further study.

The diet was developed by Dr. Margaret Ohlson at Michigan State College in East Lansing and tested on students at Cornell University under the direction of Dr. Charlotte M. Young.

Meat of any kind in two meals a day, one egg, one slice of bread a day and fruits and vegetables are included in this high protein, moderate fat, low sugar and starch diet.

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ECOLOGY

People Don't Stray Far In Day-To-Day Travels

➤ DESPITE MODERN transportation, human beings do not stray very far away from their homes as a general rule.

To the meeting in Minneapolis, Minn., of the Ecological Society of America, composed of scientists who study the interplay between environment and the living things in it, Dr. David E. Davis of the Johns Hopkins University School of Hygiene and Public Health, Baltimore, reported a study of "the home range of humans." He went at the job as though he was studying some other sort of animal or living creature.

Disregarding unusual trips and week-end travels, he found as a by-product of a Baltimore traffic survey that regular round trips on an average week day were approximately 2½ to 3 miles in length. Of the trips studied, 43 per cent were within two miles, 71 per cent within 4 miles, 88 per cent within 6 miles and 96 per cent within 8 miles.

Dr. Davis concluded that as has been found the case for other mammals, Homo sapiens, which is the scientific name for people, have a very limited range in their day-to-day life.

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PSYCHOLOGY

Brighter Offspring Born When Mamas Fed Glutamic

➤ FEEDING GLUTAMIC acid to expectant mothers makes the babies brighter. At least this is indicated by experiments on rats conducted by Dr. Alex L. Sweet, of the University of Kansas, Lawrence.

Two pairs of sister rats, each pair mated to the same male, were the subjects on this experiment. One sister of each pair was given 300 milligrams of glutamic acid each day in addition to her regular feedings. The other sister, for comparison, did not receive the chemical.

The offspring when they reached eight weeks of age were tested on their ability to learn to run mazes. A larger proportion of the young of the glutamic-fed mothers could learn to solve the problems and they made fewer errors than did the young of mothers who did not receive this "brain food." Dr. Sweet reported his findings to the American Psychological Association meeting in Chicago.

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INVENTION

"Hands Up!" Taxi Driver's Push Button Raises Shield

➤ SAFETY FOR taxi drivers from robbers posing as passengers is promised with a protective shield which is ordinarily hidden in the back of the driver's seat but which shoots up to the ceiling when released by a secret button handy to the driver.

Patent 2,566,032 was awarded to Irwin J. Poland of Baltimore, Md., for this handy device.

The shield is made of bullet-proof metal. The mechanism that shoots the shield up to the ceiling also activates locks on the doors and windows. The passenger is trapped, and the driver can deliver him to the police without further trouble.

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GENETICS

More Meat and Milk

Improved livestock will produce a greater proportion of meat and milk for us. "Sky is the limit" to the increased production if nutrition and environment are suitable.

➤ GOOD NEWS for livestock breeders comes from two British scientists, one a geneticist, the other an animal physiologist, who gave their views on livestock improvement at the recent meeting of the British Association for the Advancement of Science at Edinburgh.

The scientists were concerned with the responsibility of improving livestock so that they produced a greater proportion of meat and milk for our table.

The geneticist, Prof. R. A. Fisher, of Cambridge University already renowned for his work on the inheritance of blood groups, noted that "livestock improvement at the moment is, from the genetical viewpoint, like a chemical industry of national importance in which the experts know of very few elements, though they suspect the existence of a great many more."

Because of this Prof. Fisher is optimistic that a great deal remains to be done in the genetic improvement of our livestock.

"Land long fallow is sometimes very productive; unworked gold mines are the best gold mines," Dr. Fisher said. "Because nothing effectual has been done, we may at least feel that the law of diminishing returns has not yet set in and that the ceiling of genetic potentiality is still a very long way off."

Dr. John Hammond, Cambridge University physiologist, was even more optimistic about the physiological possibilities of getting more meat and milk from our livestock.

Posing the question: "What are the physiological limits to increased production in animals?" Dr. Hammond then emphatically answered his own question with "There are none!"

"The sky is the limit," he said, "provided suitable nutritional and other environmental conditions are given."

Listing the priority claims of the various body tissues for the feeding stuffs the animals consume, Dr. Hammond said it was well established that brain and bone had the highest priorities, with muscle and fat lagging behind.

In order to get the maximum edible muscle and fat in return for the feedstuffs we put into our livestock, we must aim for the type of animal that has a small head and legs in proportion to the rest of its body—and indeed that is the formula which has been used with great success in the development of our market hogs and beef cattle.

"But," added Dr. Hammond, "evolution in this respect has not yet finished. We now have the faster-than-sound plane. Why should there be a limit to the animals' production, provided we have the right construction and the fuel to drive it?"

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AERONAUTICS

Refueling in Air Aided by Tanker Plane Belly Lights

➤ REFUELING AIRPLANES in the air is made easier by belly lights on the tanker plane which let the pilot of the receiving craft know when he is in correct position for the proper placement of the fuel tube which brings gasoline from the tanker above into his tanks.

These so-called "traffic lights" on the underside of the tanker have a green light and four red ones. The green indicates proper position. The four reds, each bearing its own code letters, show the pilot if he is too far forward or too far to the rear for the proper reception of the feeder tube, or if he is too high or too low in the air.

The traffic light system is designed to replace communication between the planes by radio as is now done in refueling in the air. One great advantage is that the lights make refueling at night about as easy as in daylight. They are already on trial on Boeing tanker planes in the U. S. Air Force service.

Details of the system were given at the meeting of the Illuminating Engineering Society in Washington by Alston Rodgers of General Electric, the company that developed the new sealed beam lamp that is used in the lighting. When the telescoping section of the fuel-feeding boom is extended to the proper length and the boom's elevation angle is correct, the green light glows, he said. If the receiving plane gets out of position, the green fades and one of the reds brightens up, telling the pilot which way to move.

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AIRPLANE TRAFFIC LIGHTS—To guide pilots during a mid-air refueling, "traffic lights" are being installed on Boeing tankers. The center panel remains lighted green when the two airplanes are in proper contact. When the planes are not in correct refueling position, one or two of the four direction panels flash red with the necessary instructions.

PUBLIC HEALTH

Wild Birds Carry Virus Causing Encephalitis

➤ WILD BIRDS are the natural reservoir for the virus of encephalitis, scientists of the U. S. Public Health Service's Communicable Disease Center have discovered.

Encephalitis is a brain disease sometimes called sleeping sickness because of the drowsiness which is one of its symptoms. When it attacks horses, it is known as blind staggers.

Certain species of mosquitoes carry the virus and it has for many years been suspected that wild birds constituted a reservoir. Proof of this has now been obtained by the Public Health Service researchers who found the virus twice in redwing blackbirds and once in magpies living under natural conditions.

The discovery was made by a team of scientists at Greeley, Colorado, working under the direction of Dr. T. Aidan Cockburn at the office of midwestern CDC services at Kansas City, Kans.

Science News Letter, September 15, 1951

CHEMISTRY

Make Red Paint From Pickle Liquor Waste

➤ RED PAINT can be made from waste water from iron processing industries by a continuous automatic salvaging process reported to the American Chemical Society Diamond Jubilee meeting in New York by Drs. C. C. DeWitt and M. D. Livingood of Michigan State College at East Lansing.

They found that pigments ranging in shade from black through brown to bright red were obtained from liquids like those from industrial pickle liquors in a study carried on at Michigan.

The scientists then built a pilot plant to oxidize and concentrate the red pigment by continuous process.

Science News Letter, September 15, 1951

CHEMISTRY

Pre-Cursor of B-12 Vitamin Discovered

➤ DISCOVERY OF chemical compounds that are precursors of vitamin B-12, essential in animal growth, was announced to the American Chemical Society meeting in New York by Dr. J. J. Pfiffner and a group of chemists from Parke, Davis and Co., Detroit.

An organism not yet completely identified was found in the stomach of cows and it produced a mixture of cobalt-containing pigments, two of which were isolated in crystalline form. These two forms of what is called pseudovitamin B-12 do not in themselves produce the spurt in chick growth that true vitamin B-12 does, but they are used in the alimentary tract of cud-chewing animals to manufacture the B-12 vitamin which cows and other such animals provide for themselves.

Because quantities of B-12 vitamin are being used in feeding chickens and pigs, the newly discovered intermediate products may prove of use in the possible artificial manufacture of this chemical.

Science News Letter, September 15, 1951

INVENTION

Patented Doll Grows Up While You Watch It

➤ A DOLL that grows as you watch it is among the inventions on which the government has recently issued a patent. It is a mechanical growth in length, aided by a clock motor device.

The doll is made in two parts, one of which overlaps the other in the waist section. Mechanism is provided inside which lengthens the body slowly, the mechanism being activated by the clock motor. The clock is wound by hand.

Patent 2,564,813 was issued on this device. Inventor is William Robert Moyers, Sr., St. Augustine, Fla. The actual simulation of a growth effect is accomplished by coiled springs, but the springs are controlled by the clock movement.

Science News Letter, September 15, 1951

ENGINEERING

Traffic Accident Rate Cut By Better Street Lighting

➤ BETTER STREET lighting provided in Kansas City, Mo., during the past few years has greatly cut the number of traffic accidents, the Illuminating Engineering Society meeting in Washington was told by T. J. Seburn, traffic engineer of that city.

Citing certain streets with improved lighting, he stated that the number of accidents per year on them is now 1,329 property damage accidents, 220 injuries and 10 fatalities. With the old lights, with the use of a day-time to night-time ratio, there would have been 1,559 property damage accidents, 319 injuries, and 17 fatalities.

The job of replacing the lighting system then in use with improved electrical lamps was begun in 1945. For several years before that date the traffic accident experience had shown that with one-third of the total traffic using the streets during the hours of darkness, approximately three-quarters of the serious traffic accidents occurred.

Figures on accidents presented by him show a rather slight decrease in property damage accidents, a much more pronounced reduction in injury accidents and a very gratifying reduction in fatal accidents.

Science News Letter, September 15, 1951

NUTRITION

New B Vitamin Family Discovered, One Isolated

➤ DISCOVERY OF a new family of B vitamins, with isolation of one of them, is announced by the University of Texas.

The discovery was made by Dr. Lester J. Reed, researcher at the University of Texas Biochemical Institute, Austin, with the collaboration of Dr. I. C. Gunsalus of the University of Illinois at Urbana.

The new vitamin group is called the lipoic acid family and the first isolated vitamin is called alpha lipoic acid. These vitamins are said to be a key factor in the utilization of sugars and starches and are found throughout nature.

The alpha lipoic acid vitamin was obtained from liver. The vitamins were found by studying fermentation of sugars and starches by bacteria.

Science News Letter, September 15, 1951

ICHTHYOLOGY

Poor Fish! One in Thousands Has Pancreatic Cancer

➤ THE FIRST known case of a tumor of the pancreas in a fish has been reported by Drs. Myron Gordon and Ross F. Nigrelli of the New York Zoological Society.

The tumor was a cancer. Although thousands of fish have been bred and reared in the genetics laboratory of the New York Aquarium, and thousands of others have been autopsied, "only a single adenocarcinoma (cancer) of the pancreas was found," they state.

The human pancreas is a large gland that produces insulin and digestive ferments. Thin slivers cut from the pancreatic fish tumor showed that they were "remarkably similar" to those of comparable pancreatic cancers in man, they found. They do not know what caused this unusual tumor. The growth occurred in a region that may correspond to the tail of the pancreas in mammals.

Science News Letter, September 15, 1951

IN SCIEN

PLANT PATHOLOGY

Seed Fungus Spotted Faster and Cheaper

➤ A FASTER, cheaper method of determining seed-borne fungus diseases has been developed by the University of California College of Agriculture at Berkeley.

By using natural instead of artificial food materials, William C. Snyder and H. N. Hansen, professors of plant pathology, have found that fungus diseases in or on seeds can be identified in about one-third the normal time.

Bean straw, peas, wheat seed, fresh or dehydrated fruits and vegetables, dead insects and soil are some of the natural materials used as food for the fungus. Five to seven days after the seeds to be tested are placed on food material any fungus growth present can usually be identified.

On artificial food the fungus takes two to three weeks to grow. In this rich medium the fungus grow abnormally large and identification is not always possible. Growth on the natural material is more like the appearance in nature.

Science News Letter, September 15, 1951

TECHNOLOGY

Dunk Paper in Water— It Comes Out Dry

➤ YOU CAN dunk some wrapping paper in water today and it will come out quite dry. You can count on some paper bags to get wet milk bottles home without tearing. Yes, wrapping paper today looks just like it did in grandfather's time, but it has acquired many new tricks.

New treatments have been developed to make paper water-repellent or to give it wet-strength, but paper itself is made in pretty much the same way it was created centuries ago. Machines have replaced skilled hands, but it always begins as pulp and takes lots of water in the process.

Materials for making paper—a scientific way to amuse yourself or the kids on a rainy day—plus a number of interesting papers can now be obtained through SCIENCE SERVICE. The kit includes paper pulp, Fourdrinier wire, and a cardboard box from which to cut the two frames traditionally used in making paper by hand; you supply the water, egg beater and bucket.

The kit is available for the nominal sum of 75 cents, one of the monthly "THINGS of science" service. Just write SCIENCE SERVICE, 1719 N St., N. W., Washington 6, D. C., and ask for the paper making kit.

Science News Letter, September 15, 1951

ENE FIELDS

CHEMISTRY

Natural Gas Liquids Add To Motor Fuel Supply

➤ ONE GALLON of motor fuel can be added to every ten now available for America's automobiles by squeezing the liquid fuel out of the great out-pouring of natural gas.

Dr. B. R. Carney of the Warren Petroleum Corporation, Tulsa, Okla., told the American Chemical Society meeting in New York that nearly 150,000,000 barrels of liquids could be condensed out of available natural gas by methods now developed.

These natural gas liquids propane and butane can be used directly as motor fuel for tractors, trucks and buses and they can be blended in conventional gasoline.

At present the natural gas liquids are used as raw material for synthetic fibers, electrical insulation, refrigerants, alcohol, synthetic rubber, but they could be most valuable economically by burning them in engines for vehicles.

Science News Letter, September 15, 1951

INVENTION

Disposable Bag for Home Vacuum Cleaners Patented

➤ AN UNPLEASANT household task is eliminated with a disposable bag for vacuum cleaners which is thrown away when sufficiently used. Inventor is George W. Holt, Jr., Menominee, Mich. Rights to patent 2,564,845 which he received are assigned to Marathon Corporation, Rothschild, Wis.

It is a paper carton, perforated with holes and having an inner filter lining. The lining catches the dirt while the air escapes through the holes. The bag is easily inserted and removed from the vacuum cleaner.

Science News Letter, September 15, 1951

ARCHAEOLOGY

Pottery Links Stone Age People in Japan to America

➤ A LINK between the culture of the Stone Age people of Japan and ancient Americans was found by scientists at the Smithsonian Institution in Washington.

The tie is in a large collection of New Stone Age pottery found by Major Howard MacCord in a recent tour of Army duty on the Japanese island of Honshu. Designs, surface treatments and shapes of these pottery remains have a marked similiarity to those of early American Indians in the eastern United States and Canada.

In Japan as in the U. S., the ancient people pressed cords into the soft clay of their dishes to form a decorative design. Both peoples decorated their pottery by pressing cloth, basketry, or net into the soft clay. Both peoples made bumps on the rims of their dishes, and made the bases pointed so that water would boil more quickly.

There are, however, striking differences between the work of the aborigines of Japan and the Americans.

Archaeologists at the Smithsonian do not believe that there was any direct contact or exchange of goods between these distant peoples. Instead, they theorize that there may have been independent development of the culture of two related peoples.

The ancestors of the American Indians probably came from central Asia long before the development of pottery making. Another group from the same area may have made their way to Japan. The thinking of the descendants of both groups then probably developed along similar lines.

Science News Letter, September 15, 1951

METALLURGY

Supersonic Speeds Need High-Temperature Metal

➤ METALS ABLE to withstand much higher temperatures than any now used are needed if airplanes, rocket ships and guided missiles are to travel at ultra speeds in the region of 2500 miles an hour, British and American aviation experts were told in Brighton, England.

Metal surfaces of guided missiles will melt in mid-air because of the frictional heating of the air stream resulting from velocities three to four times the speed of sound, they were told by Dr. Nicholas J. Hoff of the Polytechnic Institute of Brooklyn, N. Y. He addressed a meeting under the joint sponsorship of the Royal Aeronautical Society of England and the Institute of Aeronautical Sciences of the United States.

All the advancements achieved by aeronautical scientists and engineers will be of little use, he said, if metallurgists do not develop new material which will stand up under the high temperatures accompanying supersonic speeds. Some scientists estimate that temperatures ranging from 2,000 to 3,000 degrees Fahrenheit will be reached as a result of friction heating up surfaces at ultra-high speeds, he stated.

One of the important duties of the progressive aircraft structural analyst is to calculate the time limit within which the structure remains safe under conditions of speed and frictional heat, he declared. Another new problem at high speeds arises in connection with the uneven heating effect of the air stream. This uneven heating can lead to thermal stresses and eventually to failure of the aircraft.

Science News Letter, September 15, 1951

BIOPHYSICS

Ultra-Sound Waves Relieve Pain But Are No Cure

➤ "SOUNDING" TREATMENTS, consisting of massaging with high frequency sound waves that cannot be heard by the human ear, can relieve pain about as well as heat and diathermy.

These ultrasonic treatments, however, are no better than heat and diathermy for pain relief and they are no cure in the sense of affecting the cause of various diseases.

These conclusions are based on the experience of a year during which some 150 patients were given 1,477 ultrasonic treatments. The conclusions were reported by Drs. Fritz Friedland, John G. Bisgrove and Bernard J. Doyle of Cushing Veterans Administration Hospital, Framingham, Mass., at the American Congress of Physical Medicine meeting in Denver.

Painful stiff neck, low back pain, bursitis and some kinds of arthritis including the stiff spine affliction, Marie-Strumpell spondylitis, were conditions treated. In these cases the VA doctors found ultrasonics safe to use. But they warn against "sounding" patients with heart trouble, pregnant women, regions of growing bone, sex glands and eyes.

Cancer, they warn emphatically should not be treated by ultrasonics because failure to use surgery and X-rays or radium may endanger the patient's life.

The red coloring matter of blood, hemoglobin, absorbs all the ultrasound waves in the blood and a significant portion of them in many solid tissues, an engineering-medical team from Philadelphia reported. Members of this team are Edwin L. Carstensen and Drs. Herman P. Schwan, George M. Piersol, and Robert B. Pennell.

Science News Letter, September 15, 1951

BIOCHEMISTRY

Blood Chemicals Tell Tales of Disease

➤ TELL-TALE CHEMICALS in the blood that give doctors clues to disease and infection have emerged from research at the Worcester Foundation for Experimental Biology.

The new indicators are cholesterol impurities in the blood. Whether they are substances from which cholesterol, fatty substance in the blood, is made or whether they are breakdown products is being sought by Drs. Erwin Schwenk and Nicholas T. Werthessen.

The damaged liver produces more cholesterol than the normal organ, the Worcester experiments with radioactive carbon labeled chemicals have shown. Because cholesterol has been blamed for hardening of the arteries and even cancer, the way in which it is formed and what happens to it in the living body is being intensively studied.

Science News Letter, September 15, 1951

AERONAUTICS

Farming From The Sky

Vast areas are now seeded, fertilized and protected from weeds, brush, insects and plant diseases by airplanes. Special airplane, Ag-1, promises expansion.

By A. C. MONAHAN

➤ FARMING is going skyward. The famous "man with the hoe" is still with us but on big farms he is being replaced by the pilot with a plane.

Aircraft is being used to seed great areas of pasture land, forest land, rice fields and other crop land. Later the same planes are used to protect the growth from destructive insects and plant diseases. They are used also to distribute chemicals to kill broadleaf weeds in grain fields and brush growing on pasture ranges.

Aerial farming is the term that covers farming processes carried out by aircraft. It is now big business in many parts of the world but particularly in the United States. Although about two decades old, it was minor business until after World War II. Since then it has grown to an activity in which some 5,000 airplanes are employed and many millions of acres are treated annually.

Its growth is due to effectiveness. Prewar experience proved that. A shortage of inexpensive planes and competent pilots prevented wider use then. But following the war the situation was changed. There were plenty of young men, skilled pilots of war planes, available and looking for jobs.

Surplus military planes were to be had at low cost. Chemical plants, freed from war work, greatly increased the manufacture of insecticides and weed-killers. And more important, farmers had learned to accept the system.

Now Big Business

It is the combination of available pilots, available planes, available chemicals and a job to be done that made big business of aerial farming almost over night. Growth, however, would have been slow if modern farmers had not become convinced that airmen could replace ground laborers and do so at a decreased cost.

Seeding from the air is an important part of aerial farming but it has limitations, of course. It is particularly successful for rough and wet areas where ground operations are difficult. That is why the plane has been used to reseed great tracts of pasture land on western ranges. Much seed is lost by surface seeding but the lesser cost of sowing from a plane makes up for this.

One noteworthy example of aerial seeding in forestry was work carried out in Maine during the winter of 1948 to restore great areas of forest lands burned out in the great fire of the preceding fall. It was a test by the U. S. Forest Service to determine the most economical way of restoring burned acreage.

In this Maine experiment, white pine seed was used. To get good distribution on the ground, the seed was mixed with three to ten times its bulk of sawdust. The seeding was done while snow was on the ground, an effective procedure to protect the seed from small wild rodents which otherwise might have eaten much of it. Fairly satisfactory germination resulted, according to officials of the Forest Service, and they predict wide use of the method.

While seeding from the air is important, spraying and dusting to control pests, diseases and weeds is even more so and this job is a big feature of aerial farming. Millions of acres of farm lands and also millions of acres of forests where spraying by other methods is necessarily done only with great difficulty are being farmed from the air.

A notable experiment in forest spraying was carried out in northeasern states during the summer of 1949 in the job of trying to eliminate the destructive gypsy moth that has played havoc with trees and other vegetation during the past two decades or so and is rapidly spreading toward the Middle West and the South.

It was a cooperative experiment, with entomologists of the U. S. Department of Agriculture working with local state officials. The effectiveness and economy of this method of insect elimination, government agents stated, offer the best hope for practical control of several forest pests.

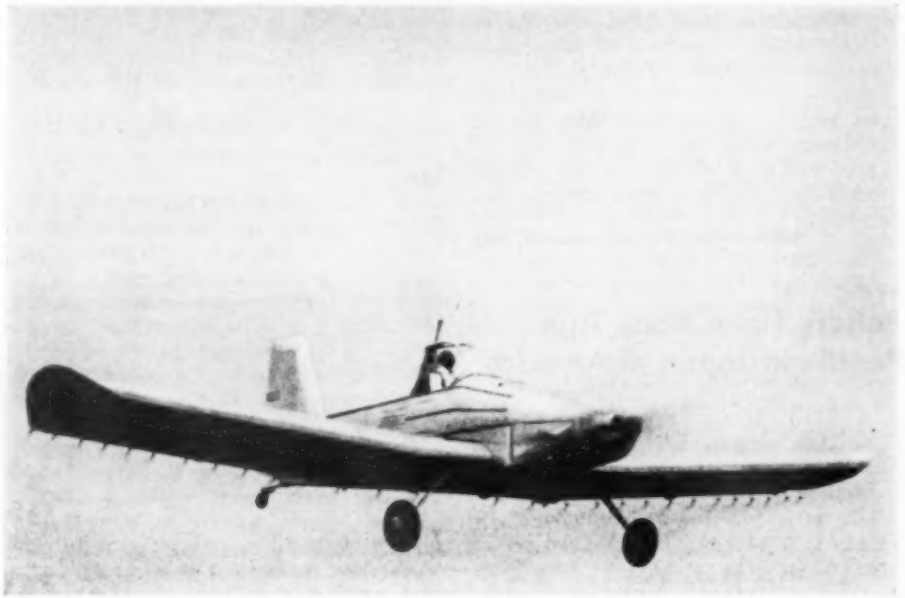
Birds Not Much Affected

Bird lovers have expressed a fear that the distribution of insecticides over forest areas would kill the birds as well as the bugs—and birds themselves are the best insect control provided by nature besides being desirable for other reasons.

However, the scientists state that the small quantities of poisons used per acre in the insecticides guard against all but minor effects on other life in the areas treated—birds, wildlife, fishes and beneficial insects such as bees.

Aerial spraying and dusting is not confined to farmlands and forests. Many cities in the United States have used the method, using DDT as an insecticide, to eliminate household flies and mosquitoes.

Many malarial sections of the world, unused because of the abundance of malaria-bearing mosquitoes, have been made habitable by aerial spraying. Notable are great sections of India that have been cleared of



SPECIAL PLANE—The CAA developed plane for aerial farming is shown here in flight. Tagged the Ag-1, it is able to fly low, slow, make quick turns at the end of a field and can take off and land on rough areas.

malaria and now are growing rice and other food products to help eliminate starvation in that country.

Farming from the air may seem a simple job to many but it is not. It takes a good plane, a good pilot and good equipment in the plane to distribute the seed or insecticide properly. Flying is dangerously low. Pilots skim over a field at an elevation not much above ordinary tree tops.

At the end of a field, the pilot must climb much higher in order to make a turnabout for a return. Time and fuel are wasted unless the turn is made quickly. There is great danger if the turn is made too quickly or at too low an altitude for the particular plane he is using.

A safer plane for seeding and spraying has long been the great need in aerial farming. Several have been developed by commercial companies. But what seems to be the best yet has been developed under sponsorship of the U. S. Civil Aeronautics Administration and it has already made many flight tests. The plane was built at the Aircraft Research Center of the Texas A & M College, College Station, Texas, under contract with the CAA.

Tagged Ag-1

The plane is now officially Ag-1, the Ag standing for Agriculture. The CAA will not build duplicates of the craft. Plans and specifications of the plane will be made available to any aviation manufacturer. Any manufacturer can build and sell this particular plane in quantity. Or he may make adaptations of it, or copy any of its features into his own design.

Particular features of this Ag-1 are its ability to fly slow, its ability to make quick turns with safety at the ends of the field and its ability to land on rough terrain with a very short run. In a recent demonstration before officials in Washington the pilot showed how the plane is easily controlled at speeds as low as 45 miles an hour, and can quickly turn at the end of a row of crops for the next pass. After several low-altitude runs and tight turns, he landed the plane and brought it to a stop in a space approximately three times the plane's length.

The plane can carry 1,200 pounds of spray or dust. It is able to lift this load from unprepared fields and quickly climb over obstacles such as power lines. It is able to do this because of a combination of high-lift wings, full-span slotted flaps and slot-lip ailerons. The pilot sits high to give him good vision. The plane has wide landing gear with heavy tires for landing on rough farm fields.

Safety feature included in the plane is protection for the pilot in case of crash landings by the long forward structure of engine and dust hopper, by the shoulder harness with inertia reel allowing freedom of action and by the guide tubes over the cockpit. Sharpened landing gear legs, and cable from cockpit to top of fin are a protection in case wires are encountered.

The plane, with its square-tipped wings, has a span of 39 feet. It is almost 30 feet in length, and has an empty weight of a little less than a ton. Its loaded weight is 3,400 pounds. Maximum speed is 115 miles an hour. It can land without payload at 37 miles per hour. It can climb at the rate of 600 feet per minute, and its take-off to clear a 50-foot obstacle requires a 1,300-foot runway.

Although some 5,000 airplanes are now in use in aerial farming, the plane is not the only type of aircraft employed. Helicopters are playing a big part, and there are many who predict that this type of craft may play a far more important part in the future. Helicopters designed particularly for the purpose are under construction.

The helicopter in aerial farming, and also for use in ridding cities of flies and mosquitoes and cleaning up malarial areas, has many advantages. One is its ability to hover over areas needing heavy applications. More important is the heavy downward draft made by its nearly horizontal rotating wings that helps drive the released material directly downward to the crop or trees. The probability is that both airplane and helicopter will be widely used in aerial farming. And the blimp also may find a place in the job.

Science News Letter, September 15, 1951

BIOPHYSICS

Human Communities Like Swarms of Molecules

➤ HUMAN COMMUNITIES act more like swarms of molecules than like mechanical models. It is disastrous, says Dr. R. Furth, Birkbeck College physicist in London, to make forecasts of human community behavior from mechanical models, or from statistics of past performances.

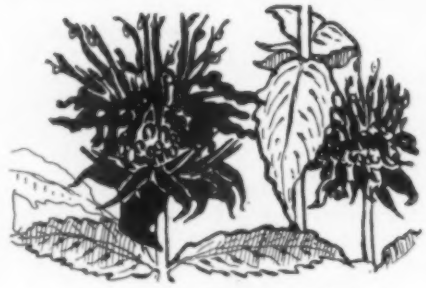
Molecules, he says, are influenced by all their brother molecules, and, therefore, the probabilities of the behavior of a particle depend on the configuration and orientation of all the other particles. This is true of human communities, in the opinion of the physicist.

Dr. Furth advocates using statistical mechanics to predict human community behavior. This, he says, is a combination of mechanical models and statistics.

Science News Letter, September 15, 1951

BOTANY

NATURE RAMBLINGS



Wild Bergamot

➤ A CLOSE rival to goldenrod and wild aster for the honors of the autumn roadside is the straggling, touseled blue flower known variously as wild bergamot, horse mint and mountain balm.

It holds out against the frost quite as well as either wild aster or goldenrod, it endures dust as bravely, and it holds up to the passer-by its little explosions of electric-blue flowers that are more eye-compelling even than the asters.

This flower sweeps across the whole eastern two-thirds of the country, from Canada to the Gulf, thriving best in straggling brushlands or open woods, and often taking complete possession of long patches of roadside hedge or between-field fencerows. Thriftless, a weed if you will, it demands no more than a poet's sustenance and gives us a poet's pay therefor.

It is not always blue. A few species go in for red, and they achieve in this hue an even more piercing effect than the arclight tint affected by the blue varieties. One species, native in Texas and now considerably used in cultivated flower gardens, is of such a vivid, assertive, even quarrelsome quality of cerise that it always has to be planted by itself. There simply is no other flower that can grow near it without clashing, not even a white one.

Why this flaming plant should have got the name *Monarda didyma* is beyond guessing—there is nothing in the least doubtful about it.

The whole genus to which the wild bergamot belongs shares with its other relatives in the mint tribe the secret of producing pungent oils used in various medicaments. As "Oswego tea," another relative was much used in folk-doctoring by the Indians and early colonists.

A more serious and authentic use was made of the plant during the first World War, when the European supplies of drugs were seriously interfered with. At that time, the wild plants of this genus were gathered by the ton and distilled to make thymol. When the world drug market was restored to something like normalcy, this temporary weed-distilling industry was abandoned.

Wild bergamot is worth introducing into informal flower gardens, and it is one of the easiest of herbs to transplant. It is a perennial, with slender rootstocks that have a most astonishing vitality. Just pull up the plants by the roots and wrap them up in three or four thicknesses of newspaper.

When planting, cut off their tops to within six or eight inches of the ground and set into the ground with a dipperful of water to get them started again. They will take hold and grow in good shape.

Science News Letter, September 15, 1951

MEDICINE

Polio Damage Lessened

➤ INFECTION WITH what is said to be the world's newest disease germ may reduce the severity of an attack of polio, it appears from studies reported to the Second International Poliomyelitis Conference in Copenhagen, Denmark.

The report was by Dr. Gilbert Dalldorf, New York State Health Department scientist who discovered the new virus about five years ago.

The virus is called Coxsackie after the Hudson River town in New York where it first was found. Several strains of Coxsackie viruses have since been discovered.

They cause various short illnesses with fever, sore throat and pain in the chest and abdomen. Sometimes infection with one of these viruses seems like a mild attack of polio. They cause diseases such as "Devil's grip," which has also been called pleurodynia, epidemic myalgia and Bornholm disease; "three-day fever;" and an illness known as herpangina, Dr. Edward C. Curnen of Yale University reported to the conference.

Summer outbreaks of infantile paralysis in New York State during the last four years have been mixed epidemics of polio and Coxsackie virus, Dr. Dalldorf reported. Records of the cases in New York suggested but did not prove that Coxsackie virus is more often associated with less severe polio.

Experiments showed that immature mice were resistant to inoculations of polio virus if these were given several days after inoculation with the Coxsackie virus.

But some authorities in the past few months have suggested the exact opposite, namely that combined infections of the two viruses were more severe than those of the polio virus alone.

Science News Letter, September 15, 1951

GENERAL SCIENCE

Try to Restore Funds

Scientists trying to figure out method of teaching Senators need for uncovering nature's secrets. Part of attempt to restore cut in National Science Foundation funds.

➤ THE NATION'S scientists are trying to figure out a way to make Congressmen aware of the need of discovering some of nature's secrets. It is this lack of awareness, they believe, which has resulted in a 98 per cent cut by the House in funds for the National Science Foundation.

If the Senate should sustain that cut, scientists think, the nation may be headed for a serious shortage in two fundamental resources: basic scientific knowledge and trained scientific manpower.

Scientists blame this Congressional unawareness partly on themselves. Quick to admit a congressman's competence in his own field of politics, the scientists are beginning to think that, with a little political know-how on their part, they might have convinced the House of the necessity to the nation's welfare of the National Science Foundation program.

Now they must try to convince the Senate that it is dangerous to the nation's safety to spend so large a proportion of the research dollar in using up our stock of fundamental knowledge and so little in replenishing that stock.

The A-bomb, they point out, began in the brain of a man who first said: "E equals mc^2." This was Albert Einstein and what he was saying was that matter is the same as energy. Other scientists took that knowledge and found out how to convert one sort of matter, called uranium, into the energy of the A-bomb explosion.

Such formulas might be called the "horseshoe nails" of present day wars. For lack of this kind of horseshoe nail, and the funds to construct it, we may lose the next war, scientists believe.

Today, they say, knowledge is needed to give us the secret of the way a green leaf or a blade of grass uses the energy of the sun. It will probably be needed sooner than the Congressmen think.

We use the energy of the sun when we burn coal or oil to run our factories and our machines of war. We are using this stored energy prodigiously and one of these days we may run out. We are just beginning to learn how to use the energy stored in the atom, by converting it directly from matter to energy.

In the years to come we may have to depend more directly on the energy of the sun for our very existence and for our defense against our enemies. This is the sort of research for which the Science Foundation was designed.

We also need the men and women to carry on this research. We need to train more scientists, we need to find ways of discovering scientific talent in the young, and then developing it.

The National Science Foundation asked Congress for $8,000,000 to make a beginning in closing up some of the gaps in our scientific knowledge and for $5,000,000 to train more badly needed scientists. The House turned the Foundation down. Scientists hope they can find a way to convince the Senate that this is one cut in funds which will turn out to be poor economy.

Science News Letter, September 15, 1951

PLANT PATHOLOGY

Banana Antibiotic Gives Chemical to Fight Fungus

➤ SOME BANANA plants grow their own antibiotic "factories" with which to fight off disease germs. A group of British and West Indian scientists have developed from this discovery a new chemical preventing damage from fungus.

Some banana plants are resistant to the highly destructive Panama-disease. They have in their root systems a strain of actinomycetes, which produces streptomycin-like chemicals, deadly to the Fusarium oxysporum cubense germ, the cause of Panama-disease.

The work was done through the collaboration of the newly founded University College of the West Indies and the Colonial Microbiological Research Institute.

The actinomycete responsible for protecting the banana plants has also been isolated from Jamaican soil and cultured in the laboratory. It gives a number of pigmented strains and, so far, a powerful fungicide agent, musarin, has been isolated from the red strain, while an antibiotic highly active against gram-positive bacteria, monamycin, has been extracted from the green strain.

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CHEMISTRY

Terramycin for Jaundice

➤ TERRAMYCIN, the earth mold chemical remedy, may turn out to be a cure for a jaundice disease which kills about 30 out of every 100 patients.

The disease is known as Weil's disease, or leptospiral jaundice or leptospirosis. The germ causing it is a leptospira. Until recently there has been no effective treatment for it and doctors have been finding it much commoner in the United States than they had supposed.

A patient who was critically ill with this disease and got worse in spite of penicillin treatment showed "dramatic improvement" within 24 hours after terramycin was started, Drs. Daniel Liebowitz and Harold Schwartz of Cleveland report in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 8).

The patient was jaundiced, had uremic poisoning because his kidneys were affected, and appeared to be dying. Although one case is not enough on which to draw definite conclusions, the Cleveland doctors point out, they think the "pronounced sudden improvement" after terramycin was started seems more than a coincidence.

Science News Letter, September 15, 1951

CHEMISTRY

Chemical "Missing Link"

➤ A CHEMICAL "missing link" joining animal and plant life at the very beginning of evolution a couple of billion years ago was suggested to the American Chemical Society meeting in New York by Dr. S. Granick of the Rockefeller Institute for Medical Research, New York.

A substance that gives rise to both the hemoglobin of red blood and the chlorophyll of green plants has been discovered by Dr. Granick in special strains of the one-celled simple plant chlorella. It is a pigment called protoporphyrin isomer 9. The two prominent pigments of protoplasm, the substance of living matter, are the red iron-containing porphyrins such as present in blood and the green magnesium-containing porphyrins such as chlorophylls that capture the solar energy and convert it into food in plants.

From the protoporphyrin, considered the great-ever-so-great chemical grandparent, the red and green pigments of animals and plants evolved by the insertion of iron into this chemical to form the heme pigments and the insertion of magnesium to form chlorophyll.

There also evolved, in Dr. Granik's conception, the catalysts in protoplasm that take part in the decomposition and formation of water, which are fundamental life processes. These functions were present in the early beginnings of protoplasmic processes and became specialized and effective as the animals and plants evolved during the long millenia of the rise of life upon the earth.

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GENETICS

Radiologists' Children Studied for A-Bomb Hints

➤ EFFECTS OF atomic bombing on children and grandchildren of survivors may be learned before long from a study of persons living here in the United States.

A human population of several thousand persons whose offspring might show hereditary defects or abnormalities for radiation exposure of the parents already exists in this country. This population consists of the physicians, laboratory aides and others who are constantly exposed to radiation through their work in X-ray or radium treatments.

A survey by questionnaire of some 4,000 of these persons will be made by Dr. Stanley H. Macht of the Washington County Hospital, Hagerstown, Md., under a grant from the National Institutes of Health.

Besides surveying the 4,000 radiologists, Dr. Macht will survey through identical questionnaires 4,000 physicians who do not come in contact with radiation of any type. Questions to be asked cover not only what defects if any have developed among the children but also what effects radiation may have had on childbearing including sterility, stillbirths and the like.

Results of the survey may not give complete answers on what the results of atomic bombing are, because of differences in the amounts of radiation exposure. But they are expected to show whether current methods for protecting workers in radiological laboratories really do protect.

Science News Letter, September 15, 1951

SURGERY

Nailing Arm to Shoulder Helps Paralysis Victims

➤ NAILING AN arm to the shoulder helps paralysis victims get more use from the arm, Dr. Garrett Pipkin of Kansas City, Mo., reported to the U. S. Chapter of the International College of Surgeons meeting in Chicago.

One 12-year-old polio victim with an almost useless right arm now can put his hand in his pocket, bring his elbow to his side and throw a baseball overhand, thanks to the nailing operation.

Altogether Dr. Pipkin has performed the operation on six patients. It has been successful in five and the sixth is progressing satisfactorily, although it is too early to know what the final result will be.

In the operation the upper arm bone is connected to the shoulder blade by a "K" nail, which gets its name from Dr. Kuntscher, the German physician who developed it. The nail ranges in length from nine and one-half to 12 inches and is driven down through the shoulder blade and arm bone to a point near the elbow.

Heretofore fusing the shoulder to the arm has involved four to six months, usually in a plaster cast. By using the nail, the cast can usually be discarded as soon as the surgical scar matures, generally in three weeks.

Besides the advantage in comfort to the patient, the nailing technique and short time in a cast avoids further wasting of muscles already below par due to polio. The nailing operation can be done on a child as young as six. As a result, growth is stimulated and serious shortening of the arm prevented.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

ALGAE OF THE WESTERN GREAT LAKES AREA: Exclusive of Desmids and Diatoms—G. W. Prescott—*Cranbrook Institute of Science,* 946 p., illus., $10.50. In the many hundreds of lakes, swamps and marshes of this region have been found about 1,100 fresh-water algae described here.

COLLOQUIM ON PLASTIC FLOW AND DEFORMATION WITHIN THE EARTH—B. Gutenberg, Chairman—*National Research Council,* 155 p., illus., paper, $2.00. Volume 32, Number 4 of the Transactions of the American Geophysical Union including papers read at a meeting in Sept. 1950.

COUNSELING EXECUTIVES AFTER MERIT RATING OR EVALUATION: A Project in Executive Development—Earl G. Planty and Carlos E. Efferson—*American Management Association,* 16 p., paper, 25 cents.

FALL OF THE SPARROW—Jay Williams—*Oxford University Press,* 158 p., illus., $3.00. The story of why certain kinds of animals have vanished from the earth.

THE HEALTHY VILLAGE: An Experiment in Visual Education in West China—*UNESCO (Columbia University Press),* 119 p., illus., paper, 50 cents. The emphasis is on practical instructions, based on experience, for the preparation of animated movies, film strips, etc., with a minimum of equipment. Generously illustrated.

HOW TO KNOW THE AMERICAN MAMMALS—Ivan T. Sanderson—*Little, Brown,* 164 p., illus., $2.50. Pictures and identifying information about the animals around you as well as many interesting facts. Also available in a paper edition. See SNL, Sept. 8.

INTELLIGENCE AND CULTURAL DIFFERENCES: A Study of Cultural Learning and Problem-Solving—Kenneth Eells and others—*University of Chicago Press,* 388 p., paper, $5.00. A study of the validity and limitations of intelligence tests for testing students of various cultural backgrounds.

INTRODUCTORY ANIMAL HUSBANDRY—Arthus L. Anderson—*Macmillan,* rev. ed., 701 p., illus., $6.00. A college text.

MATERNAL NUTRITION AND CHILD HEALTH: An Interpretive Review—Kirsten Utheim Toverud, Genevieve Stearns and Icie G. Macy—*National Research Council,* 174 p., paper, $2.00. Intended to help save the many lives of babies now lost during their first year.

NEW AND NONOFFICIAL REMEDIES—Council on Pharmacy and Chemistry, American Medical Association—*Lippincott,* 782 p., $3.00. An annual handbook for the reference of physicians.

NOBEL: The Man and His Prizes—H. Schuck and others—*University of Oklahoma Press,* 620 p., illus., $6.00. A short biographical note followed by a description of the work which has won the Nobel awards over the years.

THE ORIGIN, VARIATION, IMMUNITY AND BREEDING OF CULTIVATED PLANTS—Selected Writings of N. I. Vavilov—*Chronica Botanica,* 364 p., illus., paper, $7.50. Important writings of the famous Russian plant breeder and geneticist appearing for the first time in English in the translation of K. Starr Chester.

PUFFBALLS AND THEIR ALLIES IN MICHIGAN—Alexander H. Smith—*University of Michigan Press,* 131 p., illus., $3.00. The first serious attempt to organize what is known about these common and interesting plants in Michigan.

SANITARY MILK AND ICE CREAM LEGISLATION IN THE UNITED STATES: A study of Laws and Ordinances Establishing Sanitary Standards for Milk, Cream, and Ice Cream—A. C. Dahlberg and H. S. Adams—*National Research Council,* 59 p., paper, free upon request to publisher, 2101 Constitution Ave., Washington, D. C.

SIMPLIFIED NURSING—Florence Dakin and Ella M. Thompson—*Lippincott,* 5th ed., 730 p., illus., $4.00. A newly written edition of a familiar textbook for practical nurse students.

TWO RUNIC STONES, FROM GREENLAND AND MINNESOTA — William Thalbitzer — *Smithsonian,* 71 p., illus., paper, 50 cents. A new contribution by a Danish authority to the long raging controversy over the authenticity of two stones possibly relics of the Norsemen in America.

WAYS TO IMPROVE YOUR PERSONALITY—Virginia Bailard and Ruth Strang—*McGraw-Hill,* 249 p., illus., $3.00. Suggestions gleaned from the experience of teen-agers for making friends in school, getting along with others and handling difficult social situations.

ZOOGEOGRAPHY OF THE LAND AND INLAND WATERS—L. F. de Beaufort—*Sidgwick and Jackson, (Macmillan)* 208 p., illus., $5.00. A Dutch author tells how the animals are distributed over this earth.

THEORY OF PERFECTLY PLASTIC SOLIDS—William Prager and Philip G. Hodge—*Wiley,* 264 p., illus., $5.50. A textbook for seniors and graduates containing material most of which is very new.

Science News Letter, September 15, 1951

How to use *cottonseed flour* in baked products is a project underway sponsored by the government.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 587. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

OIL TESTER, to determine the amount of contamination in crankcase oil from the automobile engine due to carbon, metal and other particles, measures the darkness of the used oil and needs but a few drops from a dipstick to make the test. It utilizes the action of light on a photocell.

Science News Letter, September 15, 1951

ARCTIC UNIFORM for military men is lighter than present types but gives more protection from the cold and more freedom of movement. It is based on the "layer principle" with insulating layers that button into outer clothing layers. Good body ventilation is a feature.

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MEMO BOX, to hold a writing pad on the office desk, has a three-minute "hourglass" on its side to time toll-telephone calls. Made of magnetic metal, it holds handy at all times a metal pencil that comes with it. The box contains a calendar and a secret compartment for stamps and keys.

Science News Letter, September 15, 1951

ALL-RUBBER PUMPS, centrifugal units for handling both corrosive and non-corrosive liquids, are small devices for laboratory use and are powered by tiny electric motors. The stainless steel shaft within them is the only metal that makes contact with the liquid being pumped.

Science News Letter, September 15, 1951

HOME-MADE HATS, such as the one illustrated here, stoles and other articles of feminine wear are quickly made with a large crochet hook and yarns developed for this special purpose which come in a variety of colors. Instruction book, accompanying the yarn, gives full information on how to make various articles.

Science News Letter, September 15, 1951

HARDENING COMPOUND can be applied to ordinary small tools for emergency surface hardening and quickly fused to the metal with a welding torch. The preparation contains small hardening particles which, when heated, fuse with the parent metal to give a combination of hardening and hard overlay.

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HUMIDITY INDICATOR, a type with dry- and wet-bulb thermometers, has a built-in slide calculator that is easily set to show the relative humidity at a glance. In use, the wick on the wet bulb is moistened and the pair of thermometers, in their compact case, swung in the air.

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MANICURE stand, a type for use at home on which a patent has just been issued, has a base with a groove to hold a finger while nail polish is being applied, and an adjustable magnifying glass through which the finger can be viewed. Magnifying glass can be moved up and down.

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Do You Know?

The new antibiotic drugs are used to treat *dental abscesses.*

In an early process of making coke practiced over 300 years ago, a fire was started inside a pile of *coal* and the pile covered with earth.

Frozen concentrated *apple juice* is becoming an American favorite.

A *television* station in Mexico City was the first to go on the air in Latin America.

Watermelon syrup is a by-product of the watermelon seed industry; five gallons of watermelon juice make one quart of syrup.

Without columbium, chromium, cobalt and tungsten the special *steels* used in jet planes, rockets, tanks and guns can not be made.